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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,764	03/31/2004	Bo Huang	42P18121	5246

8791 7590 04/27/2007  
BLAKELY SOKOLOFF TAYLOR & ZAFMAN  
12400 WILSHIRE BOULEVARD  
SEVENTH FLOOR  
LOS ANGELES, CA 90025-1030

EXAMINER  
KANG, INSUN

ART UNIT	PAPER NUMBER
2193	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/27/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/813,764

Applicant(s)

HUANG ET AL.

Examiner

Insun Kang

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 9/26/2005, 4/26/2004, and 3/31/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/26/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This action is responding to application papers dated 9/26/2005, 4/26/2004, and 3/31/2004.
2. Claims 1-20 are pending in the application.

### ***Drawings***

3. Figures 1A and 1B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-5 are non-statutory because they are directed to a computer program without recitation of a computer or a computer-readable medium (excluding a non-tangible medium such as a signal, carrier wave etc) embodying the recited steps. The steps of the claimed method such as assigning, determining etc can be performed on a paper. The result(s) of steps of the method are not for example, stored, displayed, or conveyed by a computer in any manner causing any useful functional or structural change in the computer so as to achieve a practical application. This produced result remains in the abstract and, thus, fails to achieve the required status of having real world value. Thus the claims represent non-functional descriptive material that is not capable of producing a useful result, and hence represent only abstract ideas.

Therefore, the claims are non-statutory.

Claims 6-10 are non-statutory because they are directed to an apparatus comprising a "machine-readable medium" that includes a propagated medium such as a carrier wave and a signal as recited in the instant specification (i.e. page 12). Such medium does not have a physical structure, rather it is the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism per se. Moreover, it does not fit within the definition of the categories of patentable subject matter set forth in § 101. Thus the claims represent non-functional descriptive material that is not capable of producing a useful result, and hence represent only abstract ideas. Therefore, the claims are non-statutory.

The following link on the World Wide Web is for the United States Patent And Trademark Office (USPTO) policy on 35 U.S.C. §101. The following link on the World

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[http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101\\_20051026.pdf](http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf)

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Per claims 1, 6, 11, and 16:

It is unclear what "determining" a second register class means. It is interpreted as: determining a second register class if it is in any equivalence class with the first register class.

It is unclear to what the register class fixups are related. It is interpreted as: reducing register class fixups based on the determination and assignment of the second register class to the at least one symbolic register.

Per claims 3, 8, 13, and 18:

There is insufficient antecedent basis for the limitation "the second register" in claim 3 (line 2), claim 8 (line 2), claim 13 (line 1), and claim 18 (line 1). It is interpreted as: the second register class.

It is unclear to what the class assignment map is related. It is interpreted as: a register class assignment map for determining and assigning the second register class.

It is unclear how entry and exit of each instruction are related to the block entry and exit. It is interpreted as: entry and exit of each instruction in the block.

It is unclear as to which register class assignment map they are referring in lines 2, 3, and 5 of the body of the claims. They are interpreted as: the register class assignment map.

Per claims 4, 9, 14, and 19, it is unclear as to which register class fixups they are referring in the body of the claims. They are interpreted as: the register class fixups.

Per claim 20, there is insufficient antecedent basis for the limitation "the system" in line 1.

As per claims 2, 5, 7, 10, 12, 15, and 17, these claims are rejected for dependency on the above rejected parent claims.

### ***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Hopkins et al. (US Patent 4,961,141) hereafter referred to as "Hopkins."

Per claim 1:

Hopkins discloses:

- assigning a first register class to at least one symbolic register in at least one instruction (i.e. "for each equivalence class, forming the logical OR function of register usage information for all symbolic registers in the class," col. 1 lines 55-60; "initializing in function block 27...i is set equal to the first register," col. 4 lines 21-34)
- determining and assigning a second register class to the at least one symbolic register (i.e. after step 34 in Fig 4, i+1 is set back to FIRST REG which assigns the i+1 to the symbolic register);
- reducing register class fixups (i.e. "dead code in the program is removed in block 6," col. 2 lines 50-60; "fix up code is inserted...move the value from one space to another," col. 3 lines 33-44);
- renaming the at least one symbolic register (i.e. "If so, new names are made up in function block 39 so that there is a different name for each context," col. 4 lines 41-44).

Per claim 2:

Hopkins further discloses:

- said assigning the first register class is an initial assignment (i.e. "SET i = FIRST REG," Fig 4A).

Per claim 3:

Hopkins further discloses:

- marking a register class assignment map at a block entry (i.e. "i is set equal to the first register," which is a block entry initializing the function block; col. 4 lines 21-25; see also Fig 4 the loop block);
- marking a register class assignment map at a block exit (i.e. see Fig 4, in function block 34, i is indexed by adding one to i before looping back to decision block 28; "in the decision block 25, a test is made to determine if there are any more operations to be processed... otherwise, control passes to the interlude logic," which sets i to N (exit point) after the final loop, col. 4 lines 15-19)
- determining a register class assignment map at an entry of each instruction (i.e. ; "a test is made in decision block 28 to determine if i is less than or equal to the last register," col. 4 lines 21-34; the decision blocks 28 and 29 are performed at an entry point i)
- determining a register class assignment map at an exit of each instruction (i.e. ; "a test is made in decision block 28 to determine if i is less than or equal to the last register," col. 4 lines 21-34; the decision blocks 28 and 29 are performed at an exit point where i is set to N (exit point) after the final loop).

Per claim 4:

Hopkins further discloses:

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- said reducing register class fixups includes: hoisting and sinking register class fixups (i.e. "fix up code is inserted...move the value from one space to another," col. 3 lines 33-44);
- and removing unnecessary register class fixups (i.e. "dead code in the program is removed in block 6," col. 2 lines 50-60).

Per claim 5:

Hopkins further discloses:

- said removing unnecessary register class fixups includes removing dead code (i.e. "dead code in the program is removed in block 6," col. 2 lines 50-60).

Per claims 6-10, they are the apparatus versions of claims 1-5, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-5 above.

Per claims 11-15, they are the system versions of claims 1-5, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-5 above.

Per claims 16-20, they are the computer versions of claims 1-5, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-5 above.

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 571-272-3724.

The examiner can normally be reached on M-R 6:30-5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MENG AI AN can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

I. Kang  
AU 2193



**MENG-AL T. AN**  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100